2. INTRODUCTION

The Small Streams Toxicity/Pesticide Study is an assessment of toxicity in select small suburban and urban streams and an evaluation of the presence and concentrations of contaminants, such as pesticides, detected in these streams. This report documents the methods, results, and conclusions of this study conducted on Lyon, Juanita, Lewis, and Rock creeks in King County, Washington, in 1999.

This study was conducted in cooperation with the United States Geological Survey (USGS), the Department of Ecology (Ecology), and King County. Within the County government, it was conducted in cooperation with the Local Hazardous Waste section, the Environmental Laboratory, and managed within the Science and Technical Support Group. The Local Hazardous Waste section will use information gained from the study in their public outreach efforts, and by the Sammamish/Washington Analysis and Modeling Program (SWAMP) for the evaluation of current conditions in the SWAMP study area. Results of the study may also be incorporated into the Wastewater Treatment Division Habitat Conservation Plan, County salmon recovery efforts, and the Environmental Impact Statement for the Brightwater Facility Siting project.

The USGS and Ecology have been studying the distribution of pesticides in the Puget Sound Region since the early 1990s. (Davis 1993, Davis 1996, Davis 1998, Davis 2000, Voss and Embrey 2000, Voss et al. 1999). Much of this work has involved storm sampling, or monitoring of current trends in non-point pollution. Initial findings focused subsequent efforts on small suburban and urban streams. The highest frequency of pesticide detections has occurred in the urban/suburban setting, particularly in watersheds with a high percentage of residential land use. This has led to the hypothesis that chemicals applied to lawns and landscapes are consistently making their way into the aquatic environment through non-point runoff.

The Small Streams Toxicity/Pesticide Study was initiated in response to findings of the USGS National Water Quality Assessment (NAWQA) synoptic pesticide survey of small urban streams in King County during 1998 (Voss et al. 1999, Voss and Embrey 2000). NAWQA is a national program that has investigated over 50 of the nation's most important river basins and aquifer systems. The NAWQA pesticide survey assessed the occurrence and concentrations of pesticides in eleven streams in urban and urban/suburban King County. In that survey, between 9 and 18 pesticides or pesticide transformation products were detected in each of the 10 test streams sampled (no pesticides were detected at the reference stream, Rock Creek). Combining all streams, a total of 26 different pesticides or pesticide transformation products were detected during the study (Voss and Embrey 2000).

While the NAWQA pesticide survey assessed the occurrence and concentrations of pesticides in urban King County streams, the Small Streams Toxicity/Pesticide Study is intended to assess the potential biological effects of concentrations of contaminants, including pesticides, on a smaller subset of the NAWQA pesticide survey streams. Some pesticide data collected for the NAWQA pesticide survey at Lyon and Rock Creeks in 1998, as well as toxicity test samples collected synoptically with the NAWQA survey by King County at Lyon and Rock Creeks, are also discussed in this report as the toxicity test information has not been previously reported.